

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 795 476 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
28.07.1999 Bulletin 1999/30

(51) Int. Cl.⁶: **B65B 29/04**

(21) Application number: **97107482.8**

(22) Date of filing: **04.04.1995**

(54) Method and apparatus for producing infusion packets

Verfahren und Vorrichtung zur Herstellung von Aufgussbeuteln

Procédé et dispositif de fabrication de sachets d'infusion

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IE IT LI NL PT SE

(30) Priority: **07.04.1994 GB 9406833**

(43) Date of publication of application:
17.09.1997 Bulletin 1997/38

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
95913915.5 / 0 754 152

(73) Proprietors:
• **UNILEVER PLC**
London EC4P 4BQ (GB)
Designated Contracting States:
GB IE
• **UNILEVER N.V.**
3013 AL Rotterdam (NL)
Designated Contracting States:
BE CH DE DK ES FR GR IT LI NL PT SE AT

(72) Inventors:
• **Cahill, Michael John**
Kenilworth, Warwickshire CV8 1BG (GB)
• **Vernon, Geoffrey William**
Saunderton, High Wycombe, Bucks HP14 4JE
(GB)

(74) Representative:
Butler, David John et al
Unilever PLC
Patent Division
Colworth House
Sharnbrook
Bedford MK44 1LQ (GB)

(56) References cited:
WO-A-92/06903 **WO-A-96/15033**
CH-A- 661 905 **GB-A- 910 724**
US-A- 2 334 256 **US-A- 2 350 930**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 795 476 B1

Description

[0001] This invention relates to the production of packets in which a quantity of infusible material is held in a porous envelope which can be immersed in water to prepare an infusion. It is particularly concerned with a method of and apparatus for producing the packets, and the present patent application is divided from EP 754152 which is concerned with packets of this kind.

[0002] When an infusion is prepared using such a packet a quantity of infused liquid is retained in the packet, usually both by the infusible material and by the material of the packet envelope, and mechanical means have been proposed for extracting at least some of that liquid by applying pressure to the packet. In particular, it has been proposed as a convenient and hygienic solution to provide the packet with draw strings which can be manipulated to contract the packet. Examples of such packets are disclosed in US 3539355, 3237550, 2881910 and 2466281.

[0003] GB 910724 discloses an apparatus in accordance with the preamble of claim 7 and describes the manufacture of tagged tea bags in which a tag is attached to the bag by a thread, which however cannot function as a drawstring. The packet material is formed into a continuous series of open-topped compartments into which doses of tea are placed and then loops of thread are inserted, with ends projecting, after which the tops of the compartments are sealed and the bags are severed from each other with one end of the thread exposed.

[0004] With regard to the drawstring bags referred to above, in US 3539355, 2881910 and 2466281 a draw string or thread passes through holes in the walls of the packet, which is thus liable to leak its contents before use. Moreover, pulling on the draw strings will create high stress concentrations at the edges of the holes, with the risk of tearing and the spillage of a quantity of the infused material into the infusion as the packet is being wrung out over it. Strengthening the walls of the packet is not a solution because of cost and because it is likely to impair the efficiency of infusion.

[0005] In US 3237550 a string loop passes around the packet, the ends of the loop being held captive by a staple punched through an edge of the packet. Pulling the ends apart to shorten the loop contracts the packet. The staple must hold the ends sufficiently loosely to allow them to slide easily when the ends are pulled apart, but not so loosely that it allows the loop to slacken and slip off the other end of the packet, or the ends to slip out of the staple. It will be appreciated that close manufacturing tolerances must be maintained to ensure satisfactory use of such packets and the arrangement is thus ill-suited to economical large scale production. It is also a feature of this form of packet that the wringing action is concentrated along the centre line of the packet and the side edge regions may retain a considerable part of the liquid when the loop is tightened. A somewhat analo-

gous arrangement is shown in US 3539355, in which a stiff paper strip takes the place of the string loop. This similarly does not adapt itself to economical large scale production.

[0006] It is also known from WO91/13580, WO92/06903 and CN 93103319.5 to locate a loop of thread within a packet, an intermediate portion of the loop being anchored in a heat sealed side edge margin of the packet and the ends of the loop projecting out of the opposite side edge margin, in accordance with the preamble of claim 1. The presence of the thread in the edge seals, and in particular in the side edge anchoring the intermediate portion of the loop, weakens the seals however. This effect is intensified by the local stresses generated on the edge seal when tension is applied to the loop ends to wring moisture from the bag consequently rupture of the bag can too easily occur and the infusion material be spilled. Furthermore, these proposals for wringable infusion packets do not disclose any way in which the packets can be reasonably produced in large quantities.

[0007] According to one aspect of the present invention, there is provided a method of producing infusion packets containing doses of infusible material, in which a thread forming a pattern comprising a longitudinally spaced series of loops is enclosed between opposed heat-sealable packet walls of porous material, portions of the thread between said loops projecting from the packets to provide a means for contracting said loops when in use, said walls being secured together to form enclosed packages by heat-sealing the edges of said packets, each packet edge seal having a first region securing an intermediate portion of the associated thread loop, characterized in that in the production of packets, the looped thread is placed against one of a pair of webs of said porous material and the second of said webs is placed against the first web with the thread loops between the webs before the edges of the webs are heat-sealed together along their length and the webs are sealed together transversely at intervals along their length to divide them into a series of sealed compartments each having a thread loop and a dose of said infusible material, the separation of said compartments from the webs providing the packets, said sealing of the webs leaving channels for said portions of the thread between the loops to project from the packets.

[0008] An advantage of such a method of producing the packets is that it can operate in a continuous manner, the thread being laid in said pattern of loops in a continuous length, preferably before being brought together with said one web, and the individual loops being separated from each other after they are secured to said one web. Conveniently the material to be packaged is placed on the other of the webs before it is brought together with said one web and the looped thread thereon.

[0009] A further aspect of the invention provides apparatus for producing packets of infusible material each

containing a thread loop and a dose of said material, comprising means for bringing a pair of webs together, means for locating between the webs spaced doses of the infusible material and a series of correspondingly spaced loops of a thread, sealing means for sealing the peripheries of the packets to enclose said doses of infusible material, and means for dividing the joined webs into packets each having a dose of said material and corresponding thread loop, and for separating the ends of each thread loop from the loops of adjoining packets, characterized in that the thread locating means comprise means for forming the thread loops and for placing the spaced loops against one of the webs and attaching them thereto before the webs are brought together.

[0010] The end portions of each loop may be secured to an edge region of the webs, preferably in an easily releasable manner. The intermediate region may be secured to an opposite edge region of the webs and if so this is preferably done simultaneously with the securing of said end portions.

[0011] To form the loops a tubular delivery member may be provided as a thread guide, an outlet end of the member from which the thread is dispensed being displaceable in a circulatory path by drive means acting on the delivery member to form said loops.

[0012] In a preferred arrangement of the apparatus, the loops are formed upon a roller by means of which they are carried on one of said webs to be attached thereto before the webs are brought together.

[0013] To lay the thread in an optimum form of loop may require the speed of delivery of the thread to vary in the course of forming the loop. To limit the tension produced in the thread by the cyclical acceleration, suction means may be provided to maintain a free loop of thread in a feed line to the delivery device, whereby the rate of delivery from said free loop can be varied relative to the rate of feed thereto.

[0014] The invention will be further described by way of example with reference to the accompanying drawings, in which:

Fig. 1 illustrates one form of infusion packet that can be produced by a method and apparatus according to the invention,

Fig. 2 is a schematic illustration of apparatus for producing a series of packets of the form shown in Fig. 1,

Fig. 3 illustrates a means for forming the thread loops,

Fig. 4 is a detail illustration sharing a feature of the arrangement in Fig. 3,

Fig. 5 illustrates one form of thread feed mechanism for forming the loops,

Fig. 6 illustrates a tension control device for the thread feed means, and

Fig. 7 illustrates an alternative thread feed device for forming the loops.

[0015] Fig. 1 illustrates a tea bag T which comprises two identical layers 2 of conventional heat sealable paper, eg. Dexter 7146 (RTM), heat sealed together around their peripheries with a crimped or flat seal 4. Within the peripheral seal 4 a dose 6 of infusible material is held between the two paper layers. A length of thread 8 is also sandwiched between the layers in a loop pattern, its crossed ends emerging from an upper edge of the tea bag.

[0016] A central portion 8a of the thread is firmly fixed by the heat seal 4 where it is between the layers in a wider, lower edge portion 12 of the seal. The two ends 8b,8c of the thread emerge from the peripheral seal at opposite ends of the wider lower edge portion 12 and extend between the layers, diagonally oppositely across the tea bag, and through the upper edge seal 14. Within the upper edge seal the two ends of the thread are held in narrow channels 16 where the paper layers are more lightly sealed together than the remainder of the peripheral seal. The retention of the thread by the heat seal material in these channels can easily be sheared by pulling on the exposed thread ends and the thread is then able to slide in these channels. It is possible alternatively to leave the channels 16 unsealed if they are sufficiently restricted to avoid any significant leakage of the contents of the bag.

[0017] In use, after the tea in the bag has been infused, the tea bag may be removed from the liquid, held by the free ends 8b,8c of the thread which are then pulled apart. Although this frees them to slide in the channels 16 they are still held within those channels and between the ends the thread 8 is still firmly secured by the wider lower edge seal portion 12. The bag itself is therefore contracted and puckered by the tension in the thread so that the infusible material within it is subjected to a wringing action to extract infusion liquid in the bag.

[0018] The top and bottom sealing margins 12,14 through which the thread 8 passes are made relatively wide to increase their resistance to tearing or delamination when the thread ends are pulled to apply a wringing force. Reliefs 22 at the ends of the lower edge portion 12 give a relatively wide seal area there to take the force that the thread applies across the seal. The relatively wide upper edge seal 14 also has the advantage of increasing the length of the channels 16 and so reducing any tendency of particles of the infusible material to escape along these restricted routes when the seal in them is broken.

[0019] Tea bags of the illustrated form can be produced in a continuous process as outlined with the apparatus of Fig. 2. This shows a first web 2a of the heat sealable paper carrying spaced doses 6 of infusible material, which have been deposited by a dosing wheel 31 in known manner, and a second similar web 2b joining the first web to enclose the doses between the webs. The second web 2b enters around the upper one of a pair of heat seal rollers 32,34 and the two webs

sealed together as they come together in the nip between the rollers to form the peripheral seals 4 before the individual tea bags are separated. Adjacent the path of the web over the upper roller 32 is a third roller 36 with which is associated a thread positioning mechanism 38 for deploying the thread in its looped pattern on the periphery of the third roller. As the laid thread comes adjacent the upper roller 36 it is attached to the web 2b running over that roller and is so carried on its web to be sandwiched between the two webs 2a,2b as they pass through the heat seal rollers 32,34. Following severing rollers 35 separate the individual packets and also cut the thread between the packets.

[0020] The sealing pattern impressed by the rollers 32,34 preferably comprises crimped lines running in the direction of movement of the webs, in particular in the lower edge region where the central portion 8a of the thread is fixed, parallel to the crimped lines. In this manner the portion 8a can be fixed without risk to the integrity of the seal.

[0021] Figs. 3 and 4 show some details of carrier means on the third roller 36 for the thread deployed from the positioning mechanism, arranged to allow a continuous series of spaced thread loops to be formed on the periphery of the roller at a pitch corresponding to the width of the tea bags. For each thread loop there is an arrangement of four projecting pins 42 provided with notches 44 (Fig. 4) or hooks or both near their outer ends, so arranged as to catch a thread that is laid around them by a dispensing wand (Fig. 4 or Fig. 6). It will be noted that the thread is shown disposed entirely to one side of a centre line 48 indicating a radial plane at the middle of the axial length of the roller. A similar thread loop pattern can therefore be laid on the other half of the roller periphery, in mirror image to the illustrated thread pattern. With this arrangement the webs 2a,2b are double the width of the individual tea bags so as to form two rows of bags side by side, the bags being separated from each other after they have been fully formed. Because the thread for each row does not extend over the centre of the web width, the two thread loop patterns are formed and secured independently of each other.

[0022] Fig. 5 illustrates a first wand mechanism for positioning the thread on the carrier means of the roller 36. The mechanism comprises a parallelogram linkage one of the arms of which is formed by a wand 52 in the form of an elongate tube 54 through which the thread is fed over an entry guide roller 56. One of the pivots of the arm 60 parallel to the wand has a fixed anchorage 62 arm 60 and a further arm 64 of the linkage have extensions 60a,64a carrying followers which are guided in closed tracks 66,68 of respective rotary cams 70,72. The cams 70,72 are rotated in synchronism and their tracks 66,68 are so shaped that the thread exit end of the wand 52 orbits on a path 74 in the form of an approximately triangular loop.

[0023] Because the third roller 36 is rotating as the

wand tip describes its loop-forming orbit, the thread 8 reaches the surface of the roller and is laid around successive sets of pins 42 in a series of loops which are spaced at intervals around the roller periphery, one such loop being shown in Fig. 3. These loops are temporarily retained by the notches or hooks 44 of the pins. In the portions of the periphery of the third roller associated with each loop a set of four heatable sealing pads 76 are provided in locations which are crossed by the thread 8. As the third roller rotates each loop is brought in turn to the paper web 2b entering the apparatus around the upper roller 32 and the associated sealing pads 76 are then heated to tack the thread to the web. The tacked thread loops are immediately released from the carrier means of the third roller 36 and travel onwards with the web 2b. The pads 76 are so located that the tacking welds are in zones that are overlaid eventually by the edge seal portions 12 and 14 of the tea bags.

[0024] To hold the thread loops stably on the third roller 36 before transfer to the web 2b and to ensure transfer without snagging, the pins 42 are preferably displaceably mounted on the roller. For example, the pins may be radially displaceable to be lowered flush with the third roller periphery when the loops are transferred; this displacement may be obtained by holding the pins resiliently in their projecting positions or by providing a cam-operated mechanism to draw the pins in. The thread may be sprung over the ends of the pins 42 as they are retracted if it is held by hooks or notches 44 such as are shown in Fig. 4. It may be desired, however, to rotate the pins, eg. by a cam mechanism operating on an arm 78 (Fig. 4) of each pin, at the moment of transfer to facilitate the release of the looped thread from the third roller.

[0025] Whatever way the transfer is effected, it is preferable to ensure that by this stage the thread has been drawn taut into the loop pattern assumed in the finished tea bag. It is particularly desirable to locate as precisely as possible the ends 8a,8b that pass through the passages 16 in the upper edge seal 14 in order to keep the width of the passages to a minimum.

[0026] Forming the loop patterns with the thread may require significant variations of velocity of the thread as it emerges from the wand. It is desirable to ensure that accelerations imposed on the thread do not lead to excessive tension loads. Fig. 6 illustrates a thread feed mechanism for limiting thread tension which comprises a motorised drive device 80 drawing the thread 8 from a bobbin 82 through an entry guide eyelet 84. Downstream of the drive device the thread runs in an open loop 8' depending into the outer end of a suction tube 86. A central barrier 88 in the tube keeps the two lengths of the loop separate and a pervious screen 90 limits the penetration of the loop into the tube. Between the barrier 88 and the screen 90 the presence of the thread loop is detected by a sensing device 92, eg. a light-sensitive device, which is connected to a control

circuit (not shown) for the drive device 80.

[0027] If the thread loop 8' is too short to reach the sensing device the drive 92 is operated to draw more thread from the bobbin. As thread gathers to lengthen the loop 8' it triggers the sensing device 92 and the drive is stopped or slowed. The distance of the sensing device from the barrier 90 and the rate at which the drive device 80 draws thread from the bobbin ensure that the thread loop 8' is always maintained at such a length that it will not tighten around the barrier 88. Apart from any friction in the wand, the tension load on the thread feed to the third roller 36 is thus limited to the suction force applied to it in the tube 86.

[0028] Fig. 7 illustrates an alternative mechanism for generating the looped path 74 of the tip of the wand 54 required to place the thread around the pins 42 on the third roller 36. The wand is held slidably in a longitudinally fixed but pivotable guide 94 so that it can move longitudinally in the guide under the action of a first driven crank 96. A second driven crank 98 pivoted to the wand remote from the guide swings the wand tip laterally and by coordination of the movements of the two cranks the required loop-form path is produced for the wand tip.

Claims

1. A method of producing infusion packets containing doses of infusible material, in which a thread (8) forming a pattern comprising a longitudinally spaced series of loops is enclosed between opposed heat-sealable packet walls (2a,2b) of porous material, portions of the thread between said loops projecting from the packets to provide a means for contracting said loops when in use, said walls being secured together to form enclosed packages by heat-sealing the edges of said packets, each packet edge seal having a first region (12) securing an intermediate portion of the associated thread loop, characterized in that, in the production of packets, the looped thread (8) is placed against one of a pair of webs of said porous material (2b) and the second of said webs (2a) is placed against the first web with the thread loops between the webs before the edges of the webs are heat-sealed together along their length and the webs are sealed together transversely at intervals along their length to divide them into a series of sealed compartments each having a thread loop and a dose (6) of said infusible material, the separation of said compartments from the webs providing the packets, said sealing of the webs leaving channels (16) for said portions of the thread between the loops to project from the packets.
2. A method according to claim 1 wherein the thread (8) is laid in said pattern of spaced loops and is thereafter transferred and secured to said one web (2b).
3. A method according to claim 2 wherein the material (6) to be packaged is placed on the other of the webs (2a) before it is brought together with the one (2b) web and the looped thread thereon.
4. A method according to any one of claims 1 to 3 wherein at said passages (16) for the thread ends the thread is detachably secured to the webs by said sealing means.
5. A method according to any one of the preceding claims wherein the thread loops of the respective packets are severed from each other simultaneously with said separation of the sealed compartments providing the packets.
6. A method according to any one of the preceding claims wherein the looped thread is placed against said one web so as to overlap a side edge of the web to form said projecting thread portions.
7. Apparatus for producing packets of infusible material each containing a thread loop and a dose of said material, comprising means for bringing a pair of webs together, means for locating between the webs spaced doses of the infusible material and a series of correspondingly spaced loops of a thread, sealing means (32,34) for sealing the peripheries of the packets to enclose said doses of infusible material, and means (35) for dividing the joined webs into packets each having a dose of said material and corresponding thread loop, and for separating the ends of each thread loop from the loops of adjoining packets, characterised in that the thread locating means comprise means (36,38) for forming the thread loops and for placing the spaced loops against one of the webs and attaching them thereto before the webs are brought together.
8. Apparatus according to claim 7 comprising a roller (36) on which said loops are formed and are carried onto one said web (2b) to be attached thereto before the two webs are brought together.
9. Apparatus according to claim 8 wherein said means (38) are provided to form the loops on said roller before the thread loops are placed in contact with said one web to be attached thereto.
10. Apparatus according to claim 8 or claim 9 wherein said loops are laid onto the roller (36) by a tubular delivery member (54) through which the thread passes, an outlet end of the member being displaced in a circulatory path to form the loops on the roller.
11. Apparatus according to any one of claims 8 to 10 wherein said roller (36) is provided with projecting

location means (42) around which the loops are held, said location means being displaceable for assisting the transfer of the loops to said other web.

12. Apparatus according to any one of claims 8 to 11 5
wherein the roller is provided with heating means (76) to attach the loops by heat seals to said one web.
13. Apparatus according to any one of claims 7 to 12 10
wherein suction means (86) are provided to maintain a free loop of thread in a feed line of thread for forming the loops to be attached to said one web, whereby to limit the feed tension of the thread.
14. Apparatus according to any one of claims 7 to 13 15
wherein means (38) for forming said thread loops are located between means (31) for dispensing said doses of material and said sealing means (32,34) for sealing the peripheries of the packets. 20

Patentansprüche

1. Verfahren zur Herstellung von Aufgußpäckchen, die 25
Dosen eines aufgießbaren Materials enthalten, bei welchem ein Faden (8), welcher ein Muster mit einer Serie von in Längsrichtung voneinander beabstandeten Schlingen aufweist, zwischen gegenüberliegenden, heißsiegelbaren Päckchen- 30
Wänden (2a, 2b) aus porigem Material eingeschlossen wird, wobei Abschnitte des Fadens zwischen den Schlingen aus den Päckchen hervorstehen, um bei Verwendung ein Mittel zum Zusammenziehen der Schlingen vorzusehen, wobei die Wände zur Bildung geschlossener Päckchen durch Heißsiegelung der Ränder des Päckchens aneinander befestigt werden, wobei jede Päckchen-Randsiegelung einen ersten Bereich 35
(12) aufweist, der einen Mittelabschnitt der zugeordneten Fadenschlinge festhält, dadurch gekennzeichnet, daß bei der Herstellung der Päckchen der geschlungene Faden (8) gegen eine von einem Paar Bahnen des porigen Materials (2b) gelegt wird und die zweite der Bahnen (2a) gegen die erste Bahn gelegt wird, wobei sich die Fadenschlingen 40
zwischen den Bahnen befinden, bevor die Ränder der Bahnen entlang ihrer Längserstreckung heiß zusammengesiegelt werden und die Bahnen in Abständen entlang ihrer Längserstreckung quer zusammengesiegelt werden, um sie in eine Serie verschlossener Kammern zu unterteilen, von welchen jede eine Fadenschlinge und eine Dosis (6) des aufgießbaren Materials aufweist, wobei die Trennung dieser Kammern von den Bahnen die Päckchen vorsieht und bei der Versiegelung der Bahnen Kanäle (16) für die zwischen den Schlingen vorhandenen Abschnitte des Fadens zwecks Herausragens derselben aus den Päckchen freige- 45
lassen werden.
2. Verfahren nach Anspruch 1, wobei der Faden (8) im 50
Muster der voneinander beabstandeten Schlingen gelegt und danach transferiert und an der einen Bahn (2b) befestigt wird.
3. Verfahren nach Anspruch 2, wobei das zu verpackende Material (6) auf die andere der Bahnen (2a) gelegt wird, bevor sie mit der einen (2b) Bahn und dem darauf befindlichen geschlungenen Faden zusammengebracht wird.
4. Verfahren nach einem der Ansprüche 1 bis 3, wobei 55
der Faden an den Kanälen (16) für die Fadenenden durch die Siegelungsmittel lösbar an den Bahnen befestigt wird.
5. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Fadenschlingen der jeweiligen Päckchen gleichzeitig mit der Trennung der versiegelten Kammern voneinander getrennt werden, wodurch die Päckchen vorgesehen werden.
6. Verfahren nach einem der vorhergehenden Ansprüche, wobei der geschlungene Faden so gegen die 60
eine Bahn gelegt wird, daß er einen Seitenrand der Bahn überlappt, um die vorstehenden Fadenabschnitte zu bilden.
7. Vorrichtung zur Herstellung von Päckchen eines aufgießbaren Materials, von welchen jedes eine Fadenschlinge und eine Dosis dieses Materials enthält, welche Mittel zum Zusammenbringen eines Bahnen-Paares, Mittel zum Aufbringen von voneinander beabstandeten Dosen des aufgießbaren Materials und einer Serie von entsprechend voneinander beabstandeten Schlingen eines Fadens zwischen den Bahnen, Siegelungsmittel (32, 34) zum Versiegeln des Umfanges der Päckchen zum Einschließen der Dosen des aufgießbaren Materials, und Mittel (35) zum Unterteilen der verbundenen Bahnen in Päckchen, von welchen jedes eine Dosis dieses Materials und eine entsprechende Fadenschlinge aufweist, und zum Trennen der Enden jeder Fadenschlinge von den Schlingen angrenzender Päckchen aufweist, dadurch gekennzeichnet, daß die Mittel zum Fadenlegen Mittel (36, 38) zum Formen der Fadenschlingen und zum Auflegen der voneinander beabstandeten Schlingen auf eine der Bahnen und zu deren Befestigung an dieser, bevor die Bahnen zusammengebracht werden, aufweist.
8. Vorrichtung nach Anspruch 7, welche eine Rolle 65
(36) aufweist, auf welcher die Schlingen gebildet und auf eine der Bahnen (2b) getragen werden, um daran befestigt zu werden, bevor die beiden Bah-

nen zusammengebracht werden.

9. Vorrichtung nach Anspruch 8, wobei die Mittel (38) vorgesehen sind, um die Schlingen auf der Rolle zu formen, bevor die Fadenschlingen mit der einen Bahn zwecks Befestigung an dieser in Kontakt gebracht werden. 5
10. Vorrichtung nach Anspruch 8 oder Anspruch 9, wobei die Schlingen auf die Rolle (36) mittels eines rohrförmigen Abgabeelements (54) gelegt werden, durch welches der Faden hindurchläuft, wobei ein Ausgangsende des Elements in einer Kreisbahn verschoben wird, um die Schlingen auf der Rolle zu bilden. 10 15
11. Vorrichtung nach einem der Ansprüche 8 bis 10, wobei die Rolle (36) mit vorstehenden Positionsmitteln (42) versehen ist, um die herum die Schlingen gehalten werden, wobei die Positionsmittel verschiebbar sind, um den Transfer der Schlingen auf die andere Bahn zu unterstützen. 20
12. Vorrichtung nach einem der Ansprüche 8 bis 11, wobei die Rolle mit Heizmitteln (76) versehen ist, um die Schlingen durch Heißsiegelungen auf der einen Bahn zu befestigen. 25
13. Vorrichtung nach einem der Ansprüche 7 bis 12, wobei Saugmittel (86) vorgesehen sind, um eine freie Fadenschlinge in einer Fadenzufuhrleitung aufrechtzuerhalten, um die an der einen Bahn zu befestigenden Schlingen zu bilden, um dadurch die Zuführungsspannung des Fadens zu beschränken. 30 35
14. Vorrichtung nach einem der Ansprüche 7 bis 13, wobei Mittel (38) zur Bildung der Schlingen zwischen Mitteln (31) zur Abgabe der Dosen des Materials und den Siegelungsmitteln (32, 34) zum Versiegeln des Umfangs der Päckchen angeordnet sind. 40

Revendications

1. Procédé de fabrication de sachets d'infusion contenant des doses d'un produit à infuser, dans lequel un fil (8) formant une configuration comportant une série, longitudinalement espacée, de boucles est enclos entre des parois opposées (2a, 2b), à sceller à chaud, en matériau poreux, du sachet, des portions du fil entre lesdites boucles sortant hors des sachets pour donner un moyen pour contracter lesdites boucles en service, lesdites parois étant fixées ensemble pour former des paquets clos par scellement à chaud des bordures desdits sachets, chaque scellement de bordure du sachet présentant une première région (12) fixant une portion intermédiaire de la boucle de fil associée, 45 50 55

caractérisé

par le fait que, dans la fabrication des sachets, le fil en boucle (8) se place contre l'une d'une paire de nappes dudit matériau poreux (2b) et que la seconde desdites nappes (2a) se place contre la première nappe, avec les boucles de fil entre les nappes, avant que les bords des nappes soient scellés à chaud ensemble sur leur longueur et que les nappes soient scellées ensemble transversalement à intervalles sur leur longueur pour les diviser en une série de compartiments scellés dont chacun comporte une boucle de fil et une dose (6) dudit matériau à infuser, la séparation desdits compartiments des nappes donnant les sachets, ledit scellement des nappes laissant des canaux (16) pour que lesdites portions du fil entre les boucles sortent hors des sachets.

2. Procédé selon la revendication 1, dans lequel le fil (8) est déposé selon ladite configuration de boucles espacées et est ensuite transféré et fixé sur ladite première nappe (2b).
3. Procédé selon la revendication 2, dans lequel le produit (8) à emballer est placé sur l'autre des nappes (2a) avant qu'elle soit réunie avec la première nappe (2b) et avec le fil en boucle qui s'y trouve.
4. Procédé selon l'une quelconque des revendications 1 à 3, dans lequel auxdits passages (16) prévus pour les extrémités du fil, le fil est fixé, de façon détachable, aux nappes par lesdits moyens de scellement.
5. Procédé selon l'une quelconque des revendications précédentes, dans lequel les boucles de fil des sachets respectifs sont séparées l'une de l'autre par cisaillement en même temps que ladite séparation des compartiments scellés donnant les sachets.
6. Procédé selon l'une quelconque des revendications précédentes, dans lequel le fil en boucle est placé contre ladite première nappe de façon à chevaucher un bord latéral de la nappe pour former lesdites portions de fil sortantes.
7. Appareil pour fabriquer des sachets d'un produit à infuser contenant chacun une boucle de fil et une dose dudit produit, comportant des moyens pour réunir une paire de nappes, des moyens pour placer entre les nappes des doses espacées du matériau à infuser et une série de boucles d'un fil espacées de façon correspondante, des moyens de scellement (32, 34) pour sceller les périphéries des sachets pour enclore lesdites doses du produit à infuser, et des moyens (35) pour diviser les nappes, réunies, en sachets dont chacun comprend

une dose dudit produit et une boucle de fil correspondante, et pour séparer les extrémités de chaque boucle de fil d'avec les boucles des sachets voisins, caractérisé par le fait que les moyens de mise en place du fil comportent des moyens (36, 38) pour former les boucles de fil et pour placer les boucles, espacées, contre l'une des nappes et les y attacher avant de réunir les nappes.

5

8. Appareil selon la revendication 7, comportant un rouleau (36) sur lequel lesdites boucles se forment et sont transférées sur ladite première nappe (2b) pour y être attachées avant que les deux nappes soient réunies.

10

15

9. Appareil selon la revendication 8, dans lequel lesdits moyens (38) sont prévus pour former les boucles sur ledit rouleau avant que les boucles de fil soient placées en contact avec ladite première nappe pour y être attachées.

20

10. Appareil selon la revendication 8 ou la revendication 9, dans lequel lesdites boucles sont déposées sur le rouleau (36) par un élément distributeur tubulaire (54) par lequel passe le fil, une extrémité de sortie de l'élément se déplaçant selon un chemin circulaire pour former les boucles sur le rouleau.

25

11. Appareil selon l'une quelconque des revendications 8 à 10, dans lequel ledit rouleau (36) présente des moyens (42) de mise en place qui dépassent et autour desquels les boucles sont maintenues, lesdits moyens de mise en place pouvant se déplacer pour aider le transfert des boucles sur ladite autre nappe.

30

35

12. Appareil selon l'une quelconque des revendications 8 à 10, dans lequel le rouleau présente des moyens chauffants (76) pour fixer les boucles sur ladite première nappe par des scellements à chaud.

40

13. Appareil selon l'une quelconque des revendications 7 à 12, dans lequel des moyens d'aspiration (86) sont prévus pour maintenir une boucle de fil libre sur une ligne d'avance du fil pour former les boucles à fixer sur ladite première nappe, limitant ainsi la tension d'avance du fil.

45

14. Appareil selon l'une quelconque des revendications 7 à 13, dans lequel des moyens (38) prévus pour former lesdites boucles de fil sont situées entre des moyens (31) prévus pour distribuer lesdites doses de produit et lesdits moyens de scellement (32, 34) prévus pour sceller les périphéries des sachets.

50

55

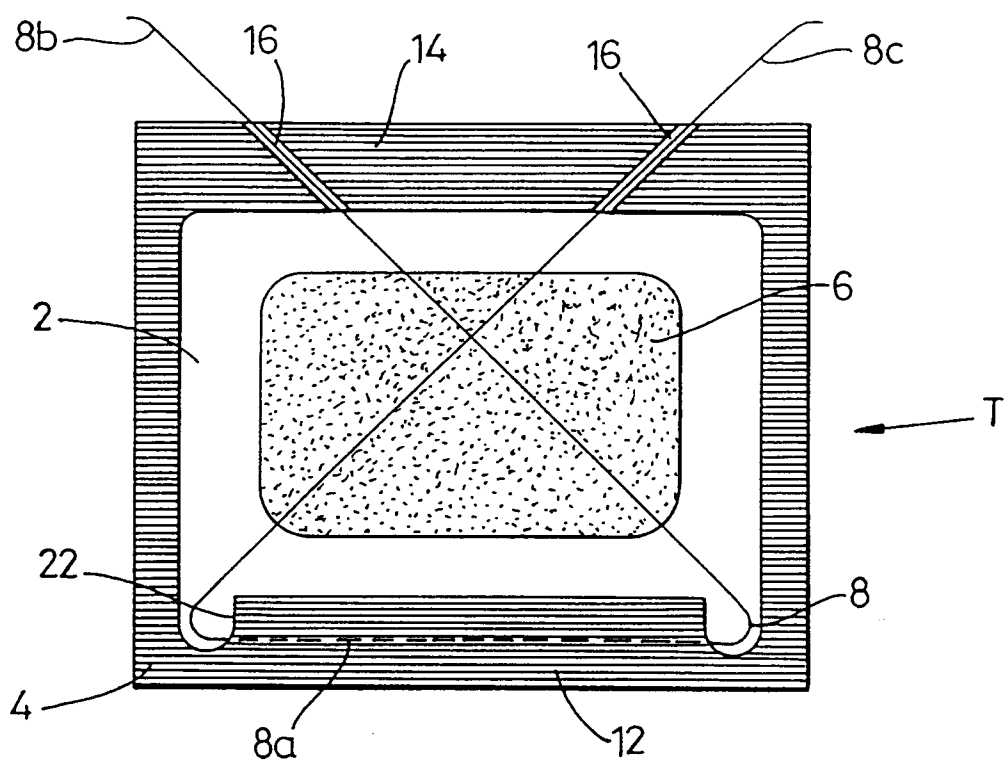


Fig. 1

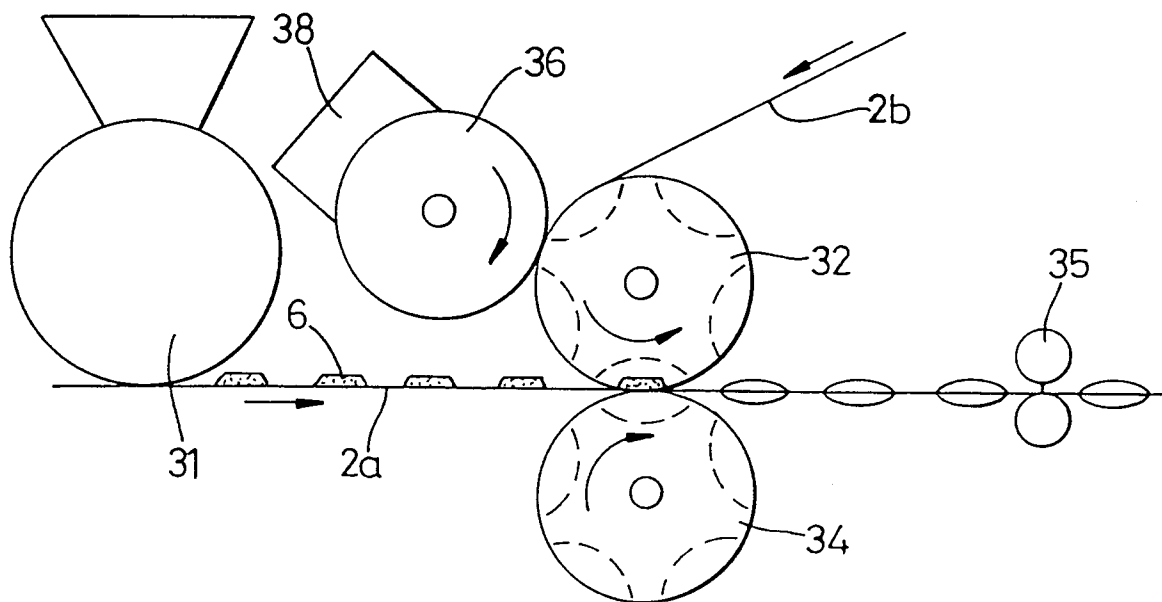


Fig. 2

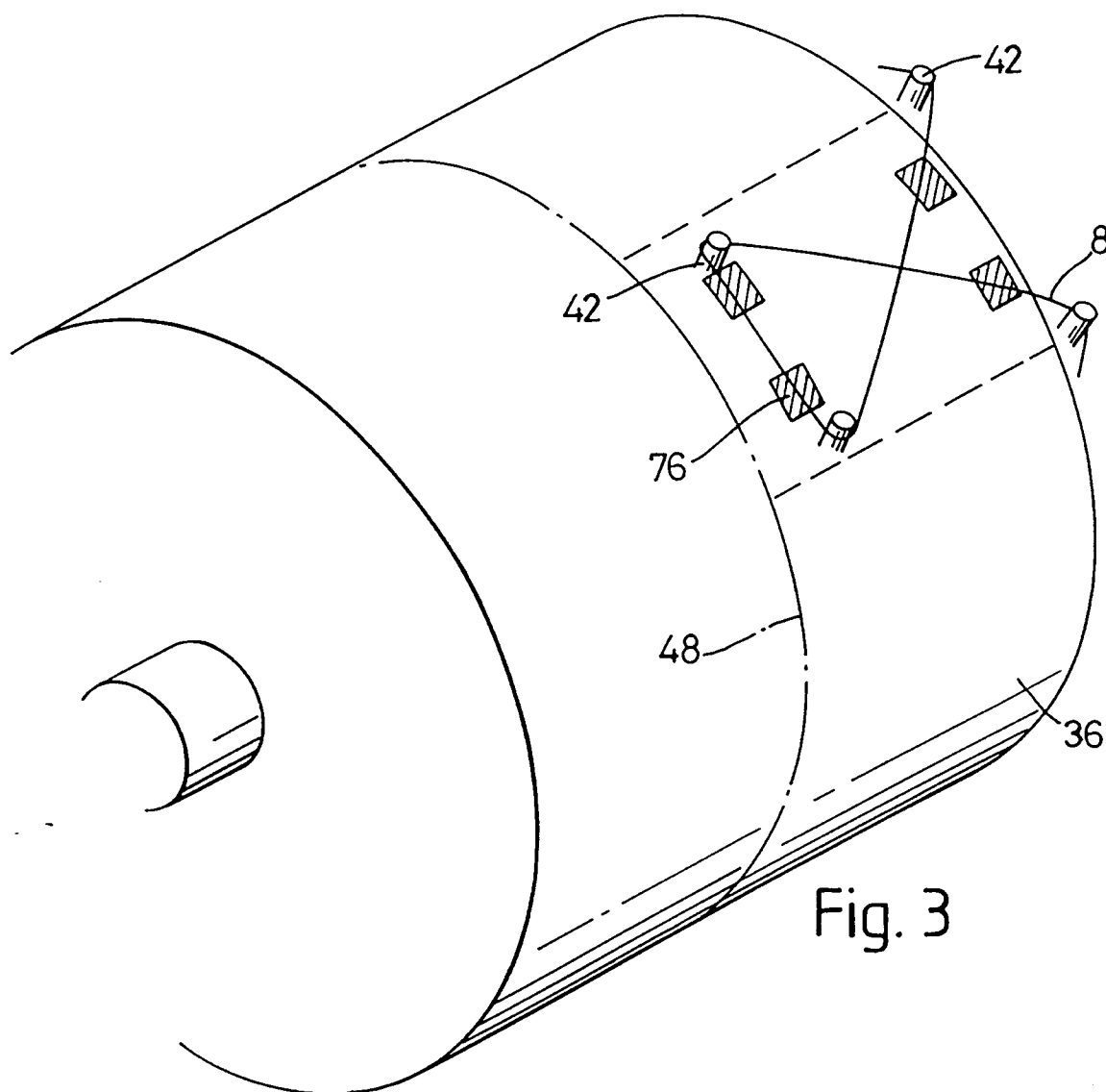


Fig. 3

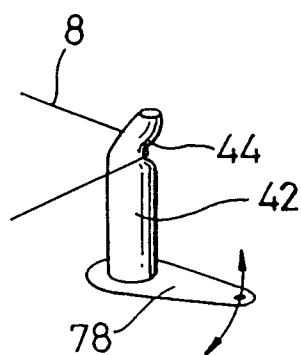


Fig. 4

